

DETAILED ACTION

1. Applicant's arguments in response to the Office action mailed on 11/19/09 have been fully considered. It is noted that applicant has cancelled all of the previously examined claims 12-28 and added new claims 29-46. Support for the new claims is found in the specification as originally filed and in previously examined claims 12-28.
2. In view of applicant's cancellation of all of the previously examined claims, the claim objections, 112-second second paragraph rejections, and the art rejections as set forth in the previous Office action (OA) are moot.
3. In view of applicant's amendment, new claim objections and 112-second paragraph rejections are made.
4. English translation of Takomi et al. (JP 11-189753) cited in the previous OA as a prior art is provided.

Claim Objections

5. **Claims 33-36 and 41-44 are objected to because of the following informalities:** Claim 33 recites "the flame retardant-containing pressure-sensitive adhesive layer". In order to fully clarify that the aforementioned flame retardant PSA is the halogen-free first PSA, the aforementioned recitation should be replaced with "the

halogen-free flame retardant-containing **first** pressure-sensitive adhesive layer".

Similar, observation is made for claims 34-36 and 41-44.

6. **Claims 32 and 40** are objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. Claim 32 recites "...wherein **the first pressure-sensitive adhesive layer** is further derived from a nitrogen-containing monomer". This claim fails to further limit the parent claim 29, because the parent claim already recites that the acrylic polymer of the first PSA contains nitrogen-containing monomer. Further, in claim 32, "the first" should be replaced with "the second". Similarly, in claim 40, "the first" should be replaced with "the second".

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. **Claims 31, 32, 34, 35, 36, 39, 40, 42, and 43 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.**

8. Regarding claim 31, said claim recites the first PSA layer is **further** derived from a carboxyl-group containing monomer. It is noted that this claim depends from claim 29 which requires that the **acrylic polymer** is derived from alkyl methacrylate monomer and a nitrogen-containing monomer. As such, regarding claim 31, it is unclear as to what is meant by **the first PSA layer is further derived from** a carboxyl-group containing monomer. Does applicant want to claim that **the acrylic polymer** of the first PSA **is further derived** from a carboxyl-group containing monomer? Similar, observation is made for claims 32.

9. With respect to claim 39, this claim recites that the first PSA contains an acrylic polymer derived from a nitrogen-containing monomer. This recitation is confusing given that this claim depends from claim 37 which recites an acrylic polymer of the first PSA is formed of alkyl methacrylate and carboxyl-group containing monomers. As such, it is unclear as to whether the acrylic polymer of claim 39 is separate from (i.e. in addition to) the acrylic polymer of claim 37. Claim 39 language should be changed to something like "wherein **the acrylic polymer of the first pressure-sensitive layer is further derived** from a nitrogen-containing monomer". Similar observation is made for claim 40.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. Claims 29-44 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takomi et al. (JP 11-189753-English translation provided) in view of Moon et al. (US 4,988,742) and as evidenced by Blance (US 3,632,412).

11. Regarding claims 29 and 37, with respect to claim limitation "A flame-retardant pressure-sensitive adhesive tape or sheet", Takomi disclose a flame-retardant acrylic PSA tape (abstract, 0004 and 0010). As to the claim requirement of a base material, 0012 of Takomi discloses a substrate (base material).

12. With respect to claims 29 and 37 limitation "a halogen free flame retardant-containing a first pressure-sensitive adhesive layer disposed upon the base material, having two sides", the first PSA comprising a metal hydrate compound, and "a metal hydrate-free second pressure-sensitive adhesive layer in contact with at least a portion of at least one side of the flame retardant-containing first pressure-sensitive adhesive layer", Takomi discloses following:

13. In abstract, Takomi discloses a multilayer adhesive tape that does not generate halogen gas, wherein the multilayer adhesive tape comprises a first adhesive layer on at least one surface of a substrate and at least a second adhesive layer that is disposed on the first adhesive layer. Further, at 0011 Takaomi discloses that in the first adhesive layer, fire retardancy can also be further raised by adding small amount of hydrated metal compounds such as aluminum hydroxide (metal hydrate).

14. Additionally, it is submitted that while Takomi at 0011 discloses addition of metal hydrate to the first adhesive layer, Takomi does not teach of addition of the metal hydrate in the second adhesive layer. As such, the second adhesive of Takomi is interpreted to be free of metal hydrate and meets the claim limitation of "metal hydrate-free" second PSA of claims 29 and 37. Additionally, based on the disclosure of Takaomi at 0010 and 0013, it is submitted that the first and second PSA layers of Takomi are formed of acrylic polymer.

15. As to the concentration of the metal hydrate compound in the second PSA (see claims 30 and 38), at 0019, Takaomi discloses that, based on 100 wt% of acrylic polymer, 15 parts by weight of aluminum hydroxide was added to the adhesive. This meets claim requirement of "15 to 400 parts by weight of a metal hydrate" as claimed.

16. With respect to claims 29-32 and 37-40, it is noted that scope of these claims require that the first PSA and the second PSA are formed of acrylic polymer

(terpolymer) composition containing monomer units of alkyl methacrylate, nitrogen-containing monomer, and carboxyl-containing monomer. Additionally, these claims require that each of the aforementioned monomeric unit be present in specific amount. Further, these claims require (see claims 29 and 37) that while the first PSA contains metal hydrate, the second PSA is free of metal hydrate.

17. **The difference between the claimed invention and Takomi is that Takomi is silent as to teaching the specific composition of the acrylic polymer of the first and the second PSA layers and weight% of the aforementioned monomeric units as claimed.**

18. However, Moon discloses an acrylic terpolymer PSA and PSA tapes comprising the acrylic terpolymer. Additionally, Moon discloses "Monomers and tackifiers may be selected such that the adhesive with a wide range of tack, peel and shear properties are possible." (column 3 lines 50-55).

19. With respect to PSA composition, according to Moon "The acrylic terpolymer pressure-sensitive adhesive of the present invention contains an **alkyl acrylate monomer, and two polar copolymerizable monomers**. The alkyl acrylate monomer is preferably unsaturated acrylate ester of non-tertiary alkyl alcohol, the molecules of which have from 6 to 12 carbon atoms. Included within this class of monomers are, for example, isooctyl acrylate...**The polar copolymerizable monomers are selected**

such that a first polar monomer is selected from strongly polar monomers such as **acrylic acid [equated to carboxyl group containing monomer]**, **itaconic acid [equated to carboxyl group containing monomer]**, hydroxyalkyl acrylates, cyanoalkyl acrylates, acrylamides or substituted acrylamides, **and a second polar monomer is selected from either strongly polar monomers such as those listed above, or moderately polar monomers such as N-vinyl pyrrolidone [equated to Nitrogen-containing monomer]**, N-vinyl caprolactam, acrylonitrile, vinyl chloride or diallyl phthalate. **The alkyl acrylate ester preferably comprises from about 60 parts to about 96 parts of the terpolymer, more preferably from about 70 parts to about 85 parts. The first polar copolymerizable monomer [carboxyl group containing monomer] preferably comprises up to about 10 parts. The second polar copolymerizable monomer [Nitrogen-containing monomer] preferably comprises up to about 20 parts, more preferably from 10 parts to about 15 parts of the photopolymerized terpolymer."** (column 4 lines 65 to column 5 lines 1-26).

20. Additionally, Example 1 of Moon discloses a PSA tape made by photopolymerization of a mixture comprising isooctyl acrylate [alkyl acrylate monomer], acrylic acid [carboxyl group containing monomer], and N-vinylpyrrolidone [Nitrogen-containing monomer].

21. With respect to the claim requirement of alkyl (meth)acrylate monomer, it is submitted that "(meth) acrylate" conventionally encompasses acrylates and

methacrylates. It is noted that Moon generally discloses alkyl acrylate based monomers, which is interpreted to meet claim requirement of alkyl (meth)acrylate monomer. Additionally, Blance (US 3,632,412) is relied upon as an evidence to show that it is known in the acrylic adhesive art to use alkyl acrylate and alkyl (meth)acrylate monomers interchangeably. Blance discloses solvent resistant electrical tapes comprising a backing member coated with a PSA composition which is a polymeric product of (A) an ester of **acrylic or methacrylic acid**, (B) a lower alkyl ester of **acrylic or methacrylic acid**; and (C) a hydroxy bearing monomer (abstract).

22. It is noted that Takaomi discloses that adhesive used in his invention can be based on acrylic resins (0010). Moon's acrylic adhesive composition has wide range of tack, peel and shear properties (column 3 lines 50-55). Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to use the acrylic adhesive composition of Moon as evidenced by Blance in the invention of Takaomi as acrylic polymer of the first PSA and the second PSA, so as to use the adhesive having wide range of tack, peel and shear properties.

23. As to claims 33-36 and 41-44, Takaomi is silent as to teaching said claims. Specifically, Takomi does not teach the placement of the second PSA on both sides of the first PSA and that the first PSA is foam.

24. However, Moon as set forth above further discloses a multilayer adhesive tape wherein the PSA layers may comprise similar or different composition having similar or different additives (column 6 lines 65-68 to column 7 lines 1-2). Additionally, at column 8 lines 50-55, Moon discloses plurality of superimposed layers of PSA having differing acrylic matrices. This disclosure of Moon is interpreted as the multilayer adhesive tape having a **structure** such as that of contemplated by applicant (i.e. Second PSA layer/First PSA layer/Second PSA layer) would have been obvious. Additionally, at column 7 lines 5-10, Moon discloses foam like adhesive tape which contains microspheres in the monomer mixture which is then used as a core or backing layer. Further, it is submitted that Takaomi discloses the presence of second PSA layer on the first adhesive (abstract).

25. Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide the second-PSA layer of Takaomi on both sides of the first PSA layer, wherein the first PSA (halogen-free flame retardant containing PSA layer) is a foam, motivated by the desire to provide strength and conformability to the multilayer adhesive tape.

26. **Claims 45 and 46 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takomi et al. (JP 11-189753) in view of Moon et al. (US 4,988,742) and as evidenced by Blance (US 3,632,412) as applied to claims 29 and 37 above, and further in view of Akihiro et al. (JP H2000-230162A1).**

27. Takaomi is silent as to teaching the weight% of metal hydrate as claimed in claims 45-46.

28. However, Akihiro discloses a flame-retardant PSA tape having high flame resistance and excellent adhesion at the same time without using a halogen based flame-retardant or antimony, both of which have negative impact on the environment and personal safety (see abstract). The adhesive of Akihiro includes flame resistant components such as ammonium polyphosphate and aluminum hydroxide in 8:2 to 3:7 ratio and the total amount of these components is 60 to 150 parts per 100 parts of the flammable components (see "Solution"-first and second page). It is submitted that since Akihiro discloses 60-150 parts ammonium polyphosphate and aluminum hydroxide per 100 parts flammable components and given the ratio of ammonium polyphosphate to aluminum hydroxide is 8:2 to 3:7 (combination has 20-70% aluminum hydroxide), Akihiro discloses of using 12 (0.2×60) to 105 (0.7×150) parts aluminum hydroxide. This disclosure of Akihiro meets claimed requirement of 30 to 200 parts by weight of metal hydrate as presently claimed.

29. It is submitted that the first adhesive of Takomi includes ammonium polyphosphates (abstract). Additionally, Takaomi at 0011 discloses that the first adhesive layer can include hydrated metallic compounds such as aluminum hydroxide.

30. Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to use the aluminum hydroxide (metal hydrate) of Takaomi in the amount including that of the presently claimed invention as taught by Akihiro, motivated by the desire to provide further fire retardancy to the adhesive tape of Takaomi.

Response to Arguments

31. Applicant's arguments submitted on 01/21/10 have been considered but they are not persuasive.

32. On page 7 of the amendment (see second full paragraph), applicant argues that the Examiner has not shown that Takomi in view of Moon as evidenced by Blance teaches or suggests all of the limitations of claims 29 or 37.

33. The Examiner respectfully disagrees given that as set forth above in this OA, Takomi et al. (JP 11-189753-English translation provided) in view of Moon et al. (US 4,988,742) and as evidenced by Blance (US 3,632,412) discloses all of the limitations of claims 29 and 37.

34. On pages 7 and 8 of the amendment, applicant argues that the Examiner has not shown that Takomi teaches or suggests a first PSA derived from a first mixture as

recited in new claims 29 and 37 particularly because Takomi does not teach or suggest nitrogen-containing monomers.

35. The Examiner respectfully disagrees. In response to applicant's arguments against the references individually, the Examiner submits that one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986). Further, the Examiner notes that he is not relying on Takomi to teach or suggest a nitrogen-containing monomer; instead as set forth previously, Moon is relied upon to teach this limitation.

36. On page 8 of the amendment, applicant argues that since the first PSA contains an acrylic polymer derived from a different monomer combination than the acrylic polymer in the second PSA, the first PSA and the second PSA necessarily have different compositions.

37. The Examiner respectfully submits that as presently recited, claims 29 and 37 are interpreted as while the **first PSA layer** is **different** (i.e. first PSA has metal hydrate whereas second PSA is free of metal hydrate) than the **second PSA layer, this does not mean that the acrylic polymers of each PSA layer are different**. This is based on the following:

38. For example, with respect to the acrylic polymer of the first PSA in claim 29, said claim recites "an acrylic polymer derived from an alkyl (meth) acrylate monomer and a nitrogen-containing monomer", and regarding the acrylic polymer of the second PSA in claim 29, said claim recites "an acrylic polymer derived from an alkyl (meth)acrylate monomer and a carboxyl group containing monomer". ***However, the aforementioned claim language is not closed*** such that the acrylic polymer of the first PSA is open to presence of other monomers e.g. carboxyl group containing monomer (i.e. acrylic polymer of first PSA can be formed of alkyl methacrylate monomer, nitrogen-containing monomer, and carboxyl group containing monomer). Similarly, the acrylic polymer of the second PSA is open to the presence of other monomers e.g. nitrogen-containing monomer (i.e. the acrylic polymer of second PSA can be formed of alkyl methacrylate monomer, carboxyl group containing monomer, and nitrogen containing monomer). As such, applicant's arguments are not found persuasive.

Conclusion

39. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

40. A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within

TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

41. Any inquiry concerning this communication or earlier communications from the examiner should be directed to ANISH DESAI whose telephone number is (571)272-6467. The examiner can normally be reached on Monday-Friday, 9:00AM-5:30PM.

42. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Callie Shosho can be reached on 571-272-1123. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

43. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a

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USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/A. D./

Examiner, Art Unit 1787

/Callie E. Shosho/

Supervisory Patent Examiner, Art Unit 1787